

# Lesson S3a

## A COLONY FOR LUNAR LIVING

SCIENCE TEKS OBJECTIVES	
§112.18	11. Earth and space. The student understands the organization of our solar system and the relationships among the various bodies that comprise it. The student is expected to: (C) describe the history and future of space exploration, including the types of equipment and transportation needed for space travel.

CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES	
§127.3 c	2. The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to: (C) develop and analyze tables, charts, and graphs related to career interests.  4. The student evaluates skills for personal success. The student is expected to: (C) use a problem-solving model and critical-thinking skills to make informed decisions.  8. The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to: (B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.
§127.4 c	1. The student explores one or more career clusters of interest. The student is expected to: (A) identify the various career opportunities within one or more career clusters. 2. The student explores pathways of interest within one or more career clusters. The student is expected to: (A) investigate career opportunities within the pathways.  6. The student explores labor market information. The student is expected to: (A) analyze national, state, regional, and local labor market information; (B) cite evidence of high-skill, high-wage, or high-demand occupations based on analysis of labor market information; and (C) analyze the effects of changing employment trends, societal needs, and economic conditions on career planning.

**Instructional Directions**

**This activity is designed to take 25 – 45 minutes as presented below.**

1. Read the scenario about living on the moon. Describe general ways life would be different on the moon.
2. Review the Workforce Solutions High-Skill, High-Growth Jobs List and determine 10 jobs that may transfer to lunar living.
3. Record your ideas and your reason(s) for selecting that job.
4. Record a different challenge for each occupation that might be unique to getting the job done considering the facts given about the moon.

**Learning Outcome(s)**

The students will understand living conditions on the moon by being able to justify the need for specific jobs needed for habitation of the moon.

**Related Industries/Occupations:**

All those found in Workforce Solutions High-Skill, High-Growth Jobs List

**Deliverables:**

Completed Blackline Master S3

**Resources Needed:**

- Workforce Solutions’ High-Skill, High-Growth Jobs List ([wrksolutions.com/jobs/doc/WFS-HSHG.pdf](http://wrksolutions.com/jobs/doc/WFS-HSHG.pdf))
- Blackline Master S3
- Lunar facts
- A computer to do more research, if needed

**Vocabulary or Concepts (New and/or Challenging):**

- Gravity
- Lunar month
- Maria
- Orbit
- Regolith
- Atmosphere



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## MODIFICATIONS & EXTENSIONS

- An activity could be created that has 20 jobs on it. Students would rank the jobs from one to 20 on the necessity of that job for the colonization of the moon. There could be a column for each to explain the justification of its given rank.
- Student choice justification written in a well-developed paragraph.
- Students could choose five jobs that may be obsolete with moon colonization and explain why.
- Create a moonscape skit with each group member representing a different job.
- Students could visit Space Center Houston to hear more about how NASA is preparing for lunar living.



Name \_\_\_\_\_

Period \_\_\_\_\_

Date \_\_\_\_\_

## A COLONY FOR LUNAR LIVING

Life on earth is getting challenging. The earth's resources just can't seem to catch up with the ever-growing human population and the demand we put on the non-renewable resources that we have used for the "necessities" of our lives. NASA engineers have been exploring the possibility of lunar living for decades, but have renewed their efforts in the past few years with the goal of having colonies on the moon by the year 2020. Just like the early explorers to the new world, adaptations have to be made for new surroundings, new challenges and new resources that are available. Imagine that your family is one of the first families to actually live on the moon and not just visit.

BASIC MOON FACTS	
distance from the Earth	356,000 – 407,000 km
orbital speed	36,800 km/hr
temperature range (night–day)	-184 – 214 °C (-141 °F)
temperature at poles	constant -96 °C
revolution period	27.3 Earth days
rotation period	27.3 Earth days
equatorial diameter	3,476 km
gravitational pull	0.16 times the Earth's

Data assimilated from: <http://nssdc.gsfc.nasa.gov/planetary/factsheet/moonfact.html>

I. Use your schema and the given background facts on the moon to list five specific ways basic life will be different on the moon:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

Name \_\_\_\_\_

Period \_\_\_\_\_

Date \_\_\_\_\_

## A COLONY FOR LUNAR LIVING CONTINUED...

- II. For life on the moon to be viable, an economy will have to be established. Therefore, there will be jobs for people to do and services that will be needed. Consider the Workforce Solutions High-Skill, High-Growth Jobs List. Determine 10 jobs that will be essential to basic living on the moon. Name each of these jobs and give a reason why your family would need the essential services of that particular job.

LUNAR ESSENTIAL JOB	JUSTIFICATION FOR THE NECESSITY OF THIS JOB
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

- III. Challenge: Choose five of the jobs above and list specific challenges that a person doing that job would encounter on the moon as opposed to living on earth.

LUNAR JOB	CHALLENGE OF DOING THIS JOB ON THE MOON
1.	
2.	
3.	
4.	
5.	

# Lesson S3b: Technology Extension

## SPACE SPIN-OFFS

SCIENCE TEKS OBJECTIVES	
§112.18	11. Earth and space. The student understands the organization of our solar system and the relationships among the various bodies that comprise it. The student is expected to: (C) describe the history and future of space exploration, including the types of equipment and transportation needed for space travel.

CAREER EXPLORATION AND PORTALS TEKS OBJECTIVES	
§127.3 c	<p>1. The student explores personal interests and aptitudes as they relate to education and career planning. The student is expected to: (C) summarize the career opportunities in a cluster of personal interest; and (D) research current and emerging fields related to personal interest areas.</p> <p>2. The student analyzes personal interests and aptitudes regarding education and career planning. The student is expected to: (D) determine the impact of technology on careers of personal interest.</p> <p>7. The student develops skills for professional success. The student is expected to: (A) demonstrate effective verbal, nonverbal, written, and electronic communication skills.</p> <p>8. The student identifies and explores technical skills essential to careers in multiple occupations, including those that are high skill, high wage, or high demand. The student is expected to: (B) analyze the relationship between various occupations such as the relationship between interior design, architectural design, manufacturing, and construction on the industry of home building or the multiple occupations required for hospital administration.</p>

### Instructional Directions

This activity is designed to take **1 – 3 hours, including writing; additional hours (2 –6) if app developed.**

1. Have students use information from [spinoff.nasa.gov](http://spinoff.nasa.gov) to look at things developed for space use by NASA that have been used by industry/individuals applying this space technology to new things.
2. Choose 10 jobs that you can connect to 10 of these spin-offs.  
– OR –  
Research tools and processes used in a given job and describe how that could be used on the moon.
3. Describe what the limitations would be considering the difference in gravity between the earth and the moon.
4. Have students write a 1–2 page paper summarizing their conclusions/findings based on the instructional direction you have chosen.

### Learning Outcome(s)

Students will identify space materials & processes that have been used in space history and then applied to industry/everyday living.

### Related Industries/Occupations

All those found in the Workforce Solutions' High-Skill, High-Growth Jobs List

### Deliverables

1–2 page paper OR this could be a paperless activity for discussion

### Resources Needed

Computer(s) to view NASA website, Workforce Solutions High-Skill, High-Growth Jobs List

### Vocabulary or Concepts (New and/or Challenging)

- Spinoff
- Velcro
- Any other term used in conjunction with the spinoffs

### MODIFICATIONS & EXTENSIONS

Consider having students use a web-based app development tool (such as Infinite Monkeys: [www.infinitemonkeys.mobi](http://www.infinitemonkeys.mobi)) to share their findings or introduce a solution to one of the identified resource challenges.



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